

[Claims]

1. A fabricating method for fabricating an electronic device comprising the steps of:

5 (a) disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

(b) disposing a hot melt type member above the first surface of the printed circuit board and/or a second surface of the functional device, and

10 (c) by heating/melting the hot melt type member, sealing a space portion formed between the printed circuit board and the functional device preventing the hot melt type member spreading into at least the space portion.

2. The fabricating method of the electronic device as set forth in claim 1, further comprising the step of:

15 prior to the step (a), disposing a frame-shaped member on the first surface of the printed circuit board in such a manner that surrounds the space portion.

3. The fabricating method of the electronic device as set forth in claim 1:

20 wherein, in the step (c), the hot melt type member is heated/melted in such a manner that the hot melt type member covers completely the second surface of the functional device.

4. The fabricating method of the electronic device as set forth in claim 1:

25 wherein, in the step (c), the hot melt type member is heated/melted while exposing all of the second surface of the functional device.

5. The fabricating method of the electronic device as set forth in claim 1:

wherein, in the step (c), the hot melt type member is heated/melted while partially exposing the second surface of the 5 functional device.

6. The fabricating method of the electronic device as set forth in claim 1:

wherein, in the step (a), the first surface of the printed circuit board and the first surface of the functional device are disposed in an opposite relation through a conductive connecting member.

7. The fabricating method of the electronic device as set forth in claim 1:

wherein, the functional device is a surface acoustic wave device; and

in the step (a), a connecting pattern of the first surface of the printed circuit board and a connecting pattern of the first surface of the surface acoustic wave device are disposed in an opposite relation through a conductive connecting member based on 20 a face-down bonding method.

8. The fabricating method of the electronic device as set forth in claim 1:

wherein the functional device is a quartz oscillator or resonator;

25 and, further comprises the steps of;

disposing, in the step (a), the connecting pattern of the first surface of the printed circuit board and the electrodes on the first surface of the quartz oscillator or resonator in an opposite

relation through the conductive connecting member based on the face-down bonding method, and connecting electrically the wiring pattern on the first surface of the printed circuit board and the electrodes on the second surface of the quartz oscillator or resonator through an electrical connecting means;

5 disposing, between the step (a) and the step (b), a surrounding member on the printed circuit board to surround the quartz oscillator or resonator; and

10 disposing, in the step (b), a hot-melt type member at least on the surrounding member.

9. The fabricating method of the electronic device as set forth in claim 1:

15 wherein the functional device is a piezoelectric oscillator or resonator; and

further comprises the step of;

disposing, in the step (a), the connecting pattern of the first surface of the printed circuit board and the electrodes on the first surface of the piezoelectric oscillator or resonator in an opposite relation through a conductive connecting member based on a face-down bonding method, and connecting electrically the wiring pattern on the first surface of the printed circuit board and the electrodes on the second surface of the piezoelectric oscillator or resonator through an electrical connecting means.

20 10. The fabricating method of the electronic device as set forth in claim 1:

25 wherein the functional device is a photocoupler possessing a pair of a light sending portion and a light receiving portion; and

further comprises the step of;

disposing, in the step (a), the connecting pattern of the first surface of the printed circuit board and the wiring pattern of the respective first surface of the photocoupler in an opposite relation through the conductive connecting member based on the face-down bonding method;

disposing, between the step (a) and the step (b), the surrounding member on the printed circuit board to surround the photocoupler; and

disposing, in the step (b), a hot-melt type member at least on the surrounding member.

11. The fabricating method of the electronic device as set forth in claim 1:

wherein the printed circuit board is a light transmitting substrate and the functional device is an EPROM; and

further comprises a step of;

in the step (a), disposing the first surface of the printed circuit board in an opposite relation with respect to the light receiving surface of the EPROM.

20 12. The fabricating method of the electronic device as set forth in claim 1:

wherein the printed circuit board is a light transmitting substrate and the functional device is a CCD;

and further comprises a step of;

25 and further comprises the step of;

in the step (a), disposing the first surface of the printed circuit board in an opposite relation with respect to the light receiving surface of the CCD.

13. The fabricating method of the electronic device as set forth in claim 1:

wherein the printed circuit board is a light transmitting substrate and the functional device is a semiconductor laser;

5 and further comprises a step of;

in the step (a), disposing the first surface of the printed circuit board in an opposite relation with respect to the light emitting surface of the semiconductor laser.

14. The fabricating method of the electronic device as set forth in claim 1:

wherein the printed circuit board is a light transmitting substrate and the functional device is a light-emitting diode;

and further comprises the step of;

in the step (a), disposing the first surface of the printed circuit board in an opposite relation with respect to the light emitting surface of the light-emitting diode.

15. The fabricating method of the electronic device as set forth in claim 1;

wherein, the functional device comprises bumps;

20 in the step (a), bumps on the functional device are disposed in an opposite relation with respect to the printed circuit board; and,

between the step (a) and step (b), the printed circuit board and the functional device are connected under irradiation of an infra-red light on the printed circuit board and/or the bumps.

25 16. The fabricating method of the electronic device as set forth in claim 1:

wherein the hot melt type member is a resin.

17. The fabricating method of the electronic device as set forth in claim 1:

wherein the hot-melt type member is a thermo-setting resin.

18. The fabricating method of the electronic device as set forth in claim 1:

wherein the hot-melt type member is an epoxy resin.

19. The fabricating method of the electronic device as set forth in claim 1:

wherein the hot-melt type member is a phenol based epoxy resin.

20. The fabricating method of the electronic device as set forth in claim 1:

wherein the hot-melt type member is a silicone resin.

21. The fabricating method of the electronic device as set forth in claim 1:

wherein the hot-melt type member is a low melt glass.

22. The fabricating method of the electronic device as set forth in claim 1:

wherein the hot-melt type member is a low melt glass of a melting temperature in the range of from 250 ° C to 400° C.

23. The fabricating method of the electronic device as set forth in claim 1:

wherein the hot melt type member is a low melt glass of a melting temperature in the range of from 320 ° C to 350° C.

24. The fabricating method of an electronic device as set forth in claim 1:

wherein the hot melt type member is a borosilicate lead glass.

25. The fabricating method of the electronic device as set forth in claim 1:

wherein the hot melt type member is at least one member selected from a group of a borosilicate lead glass and a borosilicate bismuth glass.

26. The fabricating method of the electronic device as set forth in claim 1:

wherein, prior to the step (a), the printed circuit board and the functional device are bonded for bonding temporarily between them.

27. The fabricating method of the electronic device as set forth in claim 1:

wherein a shape of the hot-melt type member is bigger than that of the functional device and nearly identical with the shape of the printed circuit board.

28. The fabricating method of the electronic device as set forth in claim 1:

wherein the hot-melt type member is a cold pressed member of a powder form raw material.

29. The fabricating method for fabricating the electronic device as set forth in claim 1:

wherein the hot-melt type member prior to a hot-melting step possesses a flap shape at periphery portion.

30. The fabricating method of the electronic device as set forth in claim 1:

wherein, in the step (c), a plurality of heating steps is included.

31. The fabricating method of the electronic device as set forth in claim 16:

wherein, the step for heating/melting/hardening the hot-melt

type member is executed under a condition in which a heating/melting/hardening temperature is in the range of from 100 to 200 ° C and a hardening time is in the range of from 20 to 2 hours.

32. An electronic wave device, comprising:

5 a printed circuit board possessing a first surface and a second surface;

a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with respect to the first surface of the printed circuit board;

10 and, a hot-melt type member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the hot-melt type member from spreading into the space portion.

15 33. The electronic device as set forth in claim 32, further comprising:

a frame shaped member which is disposed on the first surface of the printed circuit board and surrounds the space portion.

34. The electronic device as set forth in claim 32:

20 wherein the hot-melt type member is disposed in such a manner that covers all the second surface of the functional device.

35. The electronic device as set forth in claim 32:

wherein the hot-melt member is disposed in such a manner that covers a part of the second surface of the functional device.

25 36. The electronic device as set forth in claim 32:

wherein the hot-melt type member is disposed in such a manner that exposes all of the second surface of the functional device.

37. The electronic device as set forth in claim 32, further

comprising:

conductive connecting members disposed between the first surface of the printed circuit board and the first surface of the functional device.

5 38. The electronic device as set forth in claim 32:

wherein the functional device is a surface acoustic wave device;

and, further comprising conductive connecting members connecting between a connecting pattern on the first surface of the printed circuit board and a connecting pattern on the first surface of the surface acoustic wave device based on the face down bonding method.

10 39. The electronic device as set forth in claim 32:

wherein the functional device is a quartz oscillator or resonator;

and further comprises;

conductive connective members connecting the connecting pattern of the first surface of the printed circuit board and the electrode of the first surface of the quartz oscillator or resonator 20 based on the face-down bonding method; and

an electrically connecting means for electrically connecting the wiring pattern of the first surface of the printed circuit board and the electrode of the second surface of the quartz oscillator or resonator.

25 40. The electronic device as set forth in claim 32:

wherein the functional device is a piezoelectric oscillator or resonator;

and further comprises;

conductive connective members connecting the connecting pattern of the first surface of the printed circuit board and the electrode of the first surface of the piezoelectric oscillator or resonator based on the face-down bonding method; and

5 an electrically connecting means for electrically connecting the wiring pattern of the first surface of the printed circuit board and the electrode of the second surface of the piezoelectric oscillator or resonator.

10 41. The electronic device as set forth in claim 32:
wherein the functional device is a photocoupler possessing a pair of a light sending portion and a light receiving portion;
and, further comprises;

15 conductive connecting members connecting the connecting pattern of the first surface of the printed circuit board and the wiring pattern of the respective first surface of the photocoupler based on the face-down bonding method;

a surrounding member disposed on the first surface of the printed circuit board and surrounding the photocoupler; and
a hot-melt type member disposed at least on the surrounding
20 member.

42. The electronic device as set forth in claim 32:
wherein the printed circuit board is a light transmitting substrate; and

25 the functional device is an EPROM which first surface is a light receiving surface.

43. The electronic device as set forth in claim 32:
wherein the printed circuit board is a light transmitting substrate; and

the first surface of the functional device is a CCD.

44. The electronic device as set forth in claim 32:

wherein the printed circuit board is a light transmitting substrate; and

5 the functional device is a semiconductor laser which first surface is a light emitting surface.

45. The electronic device as set forth in claim 32:

wherein the printed circuit board is a light transmitting substrate; and

10 the functional device is a light-emitting diode which first surface is a light emitting surface.

46. The electronic device as set forth in claim 32:

wherein the hot-melt type member is a resin.

47. The electronic device as set forth in claim 32:

wherein the hot-melt type member is a thermo-setting resin.

48. The electronic device as set forth in claim 32:

wherein the hot-melt type member is an epoxy resin.

49. The electronic device as set forth in claim 32:

wherein the hot-melt type member is a phenol based epoxy resin.

20 50. The electronic device as set forth in claim 32:

wherein the hot-melt type member is a silicone resin.

51. The electronic device as set forth in claim 32:

wherein the hot-melt type member is a low melt glass.

52. The electronic device as set forth in claim 32:

25 wherein the hot-melt type member is a low melt glass of a melting temperature in the range of from 250 °C to 400 °C.

53. The electronic device as set forth in claim 32:

wherein the hot-melt type member is a low melt glass of a

melting temperature in the range from 320 °C to 350 °C.

54. The electronic device as set forth in claim 32:

wherein the hot melt type member is a borosilicate lead glass.

55. The electronic device as set forth in claim 32:

wherein the hot melt type member is at least one member selected from a group of a borosilicate lead glass and a borosilicate bismuth glass.

56. The electronic device as set forth in claim 32:

wherein the printed circuit board comprises a first wiring pattern formed on the first surface, a second wiring pattern formed on the second surface, and a third wiring pattern formed on side surfaces of the printed circuit board and connecting the first wiring pattern and the second wiring pattern thereof.

57. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface, wiring patterns being formed at least on the first surface thereof;

20 a functional device possessing a first surface and a second surface, the first surface being disposed in an opposite relation with respect to the first surface of the printed circuit board;

a conductive film formed on the second surface of the functional device;

a conductive material electrically connecting between the conductive film and the wiring pattern of the printed circuit board;

25 and

a sealing member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from

spreading into the space portion.

58. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface, a wiring pattern being formed at least on the first surface thereof;

5 a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with the first surface of the printed circuit board;

10 a metallic foil formed on the second surface of the functional device;

a means for electrically connecting between the metallic foil and the wiring pattern formed on the printed circuit board; and

15 a sealing member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

59. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface, a wiring pattern being formed at least on the first surface thereof;

20 a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with the first surface of the printed circuit board;

25 a conductive film formed on the second surface of the functional device;

a resin dispersed with a magnetic member electrically connecting between the conductive film and the wiring pattern formed on the printed circuit board; and

a sealing member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

5 60. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface;

10 a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with respect to the first surface of the printed circuit board;

15 and, a sealing member, which is composed of a metallic powder dispersed resin, for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

20 61. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface;

25 a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with the first surface of the printed circuit board; and

25 a sealing member, which is composed of a magnetic powder dispersed resin, for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

62. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface;

a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with the first surface of the printed circuit board; and

5 a sealing member, which is composed of a radio wave absorber dispersed resin, for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

10 63. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface;

15 a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with the first surface of the printed circuit board;

20 and, a sealing member, which is composed of a resin containing a conductive filler, for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

64. An electronic device, comprising:

25 a printed circuit board possessing a first surface and a second surface, concave parts being formed respectively on two side surfaces thereof;

a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with the first surface of the printed circuit board;

a sealing member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion; and

5 a metal plate disposed in such a manner that a pair of convex portions, which engage with respective concave portions disposed on the printed circuit board, oppose each other on two leg portions, and covering the first surface of the printed circuit board and the functional device.

10 65. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface, concave portions being formed on two side surfaces of the printed circuit board respectively, and wiring patterns being formed inside the respective concave portions;

15 a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with the first surface of the printed circuit board;

a sealing member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion; and,

20 25 a metal plate disposed in such a manner that a pair of convex portions, which engage to the respective concave portions disposed on the printed circuit board and connect electrically to the respective wiring patterns of the inner surface of the concave portions, is disposed so as to oppose each other on two leg portions, and covering the first surface of the printed circuit board and the functional device.

66. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface, stepped parts being formed on two respective side surfaces thereof, the respective first surface sides thereof being upper stairs;

5 a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with the first surface of the printed circuit board;

10 a sealing member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion; and

15 a metal plate disposed in such a manner that a pair of protruded portions, which engage to the respective stepped portions disposed on the printed circuit board, are disposed oppositely on two leg parts of the metal plate, and covering the first surface of the printed circuit board and the functional device.

67. An electronic device, comprising:

20 a printed circuit board possessing a first surface and a second surface, stepped portions being disposed on two side surfaces thereof in such a manner that the respective first surface sides thereof are upper step sides and the wiring patterns are formed on surfaces of lower steps;

25 a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with the first surface of the printed circuit board;

a sealing member for sealing a space portion formed between the first surface of the printed circuit board and the first surface

of the functional device while preventing the sealing member from spreading into the space portion; and

a metal plate disposed in such a manner that a pair of protruded portions, which engage to the respective concave portions disposed on the printed circuit board and connect electrically to the respective wiring patterns of a lower step portions, oppose each other at two leg portions, and covering the first surface of the printed circuit board and the functional device.

68. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface;

a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with the first surface of the printed circuit board;

a buffering member formed on the second surface of the functional device; and

a sealing member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

69. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface;

a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with the first surface of the printed circuit board; and,

a sealing member, which is comprised of a resin containing glass filler, for sealing a space portion formed between the first

surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

70. An electronic device, comprising:

5 a printed circuit board possessing a first surface and a second surface, a wiring pattern being formed on the first surface thereof;

10 a functional device possessing a first surface and a second surface, a wiring pattern being formed on the first surface, and the first surface being disposed in an opposite relation with the first surface of the printed circuit board;

15 a connecting member intensively disposed on a central part of the functional device and connecting electrically between a wiring pattern of the printed circuit board and a wiring pattern of the functional device; and

20 a sealing member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

71. An electronic device, comprising:

25 a printed circuit board possessing a first surface and a second surface, a wiring pattern being formed on the first surface thereof;

a functional device possessing a first surface and a second surface, a wiring pattern being formed on the first surface thereof, the first surface being disposed in an opposite relation with the first surface of the printed circuit board;

30 a first connecting member intensively disposed around a central area of the functional device and connecting electrically between the wiring pattern of the printed circuit board and the

wiring pattern of the functional device;

a second connecting member disposed around a peripheral region of the functional device and not participating in the electrical connection between the wiring pattern of the printed circuit board and the wiring pattern of the functional device; and

5 a sealing member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

10 72. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface, a first wiring pattern composed of a conductive material of a first thickness and a second wiring pattern composed of a conductive material of a second thickness thicker than the first thickness being formed on the first surface thereof;

15 a functional device possessing a first surface and a second surface, a wiring pattern being formed on the first surface thereof, and the first surface being in an opposite relation with the first surface of the printed circuit board;

20 a conductive connecting member disposed between the second wiring pattern of the printed circuit board and the wiring pattern of the functional device; and

25 a sealing member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

73. An electronic device, comprising:

a printed circuit board possessing a first surface and a second

surface, and a first board material region with a first thickness and a second board material region with a second thickness thicker than the first thickness, wiring patterns being formed on the first region and the second region of the first surface;

5 a functional device possessing a first surface and a second surface, a wiring pattern being formed on the first surface, and the first surface being in an opposite relation with the first surface of the printed circuit board;

10 conductive connecting members disposed between the wiring pattern of the second region of the printed circuit board and the wiring pattern of the functional device; and

15 a sealing member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

74. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface, a wiring pattern being formed on the first surface thereof;

20 a functional device possessing a first surface and a second surface, a wiring pattern being formed on the first surface thereof, and the first surface being in an opposite relation with the first surface of the printed circuit board;

25 a conductive connecting member disposed between the wiring pattern of the first surface of the printed circuit board and wiring pattern of the first surface of the functional device, and composed of bumps stacked according to a spacing between the wiring patterns; and

a sealing member for sealing a space portion formed between

the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

75. An electronic device, comprising:

5 a printed circuit board possessing a first surface and a second surface, a wiring pattern being formed on the first surface thereof; a functional device, a surface acoustic wave device, possessing a first surface and a second surface, a wiring pattern and a sound absorption material being formed on the first surface thereof, the first surface thereof being in an opposite relation with the first surface of the printed circuit board;

10 a conductive connecting member disposed between the wiring pattern of the first surface of the printed circuit board and the wiring pattern of the first surface of the functional device, and thickness of the conductive connecting member being thicker than that of the sound absorption material; and

15 a sealing member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

20 76. An electronic device, comprising:

 a printed circuit board possessing a first surface and a second surface, a wiring pattern being formed on the first surface thereof;

25 a functional device, a surface acoustic wave device, possessing a first surface and a second surface, a wiring pattern being formed on the first surface thereof, a sound absorption material being formed on the second surface thereof, and the first surface being in an opposite relation with the first surface of

the printed circuit board;

conductive connecting members disposed between the wiring pattern of the printed circuit board and wiring pattern of the functional device; and

5 a sealing member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

77. An electronic device, comprising:

10 a printed circuit board possessing a first surface and a second surface, a wiring pattern being formed on the first surface thereof;

a functional device, a surface acoustic wave device, possessing a first surface and a second surface, a wiring pattern being formed on the first surface thereof, a sound absorption material being formed on the second surface thereof, and the first surface being disposed in an opposite relation with the first surface of the printed circuit board;

conductive connecting members disposed between the wiring pattern of the printed circuit board and wiring pattern of the functional device;

20 a metallic foil disposed on the second surface of the functional device; and

a sealing member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the sealing member from spreading into the space portion.

25 78. The electronic device as set forth in from claim 57 to
claim 77:

wherein the sealing member is a hot-melt type member.

79. The electronic device as set forth in from claim 57 to
claim 77:

wherein the sealing member is a thermo-setting member.

5 80. The electronic device as set forth in from claim 57 to
claim 77, further comprising:

a frame-shaped member disposed on the first surface of the
printed circuit board in such a manner that surrounds the space
portion.

10 81. The electronic device as set forth in from claim 57 to
claim 77:

wherein the sealing member is disposed in such a manner that
covers wholly the second surface of the functional device.

15 82. The electronic device as set forth in from claim 57 to
claim 77:

wherein the sealing member is disposed in such a manner that
partially covers the second surface of the functional device.

83. The electronic device as set forth in from claim 57 to
claim 77:

20 wherein the sealing member is disposed in such a manner that
wholly exposes the second surface of the functional device.

84. The electronic device as set forth in from claim 57 to
claim 69, further comprising:

25 conductive connecting members disposed between the first
surface of the printed circuit board and the first surface of the
functional device.

85. The electronic device as set forth in from claim 57 to
claim 77:

wherein the functional device is a surface acoustic wave device; and, further comprising;

conductive connecting members for connecting a connecting pattern on the first surface of the printed circuit board and
5 a connecting pattern on the first surface of the surface acoustic wave device based on a face down bonding method.

86. The electronic device as set forth in from claim 57 to
claim 77:

10 wherein the functional device is a quartz oscillator or resonator; and further comprising;

a conductive connecting member connecting the connecting pattern of the first surface of the printed circuit board and the electrode of the first surface of the quartz oscillator or resonator based on the face-down bonding method; and

15 an electrically connecting means connecting the wiring pattern of the first surface of the printed circuit board and the electrode of the second surface of the quartz oscillator or resonator.

87. The electronic device as set forth in from claim 57 to
20 claim 77:

wherein the functional device is a piezoelectric oscillator or resonator; and further comprising;

25 a conductive connecting member connecting the connecting pattern of the first surface of the printed circuit board and the electrode of the first surface of the piezoelectric oscillator or resonator based on the face-down bonding method; and

an electrically connecting means connecting the wiring pattern of the first surface of the printed circuit board and the

electrode of the second surface of the piezoelectric oscillator or resonator.

88. The electronic device as set forth in from claim 57 to claim 77:

5 wherein the functional device is a photocoupler possessing a pair of a light sending portion and a light receiving portion; and further comprising;

10 conductive connecting members connecting the connecting pattern of the first surface of the printed circuit board and the wiring pattern of the each first surface of the photocoupler in an opposite relation based on the face-down bonding method;

a surrounding member disposed on the printed circuit board so as to surround the photocoupler; and

15 a hot-melt type member disposed at least on the surrounding member.

89. The electronic device as set forth in from claim 57 to claim 77:

20 wherein the printed circuit board is a light transmitting substrate; and

the functional device is an EPROM which first surface is a light receiving surface.

90. The electronic device as set forth in from claim 57 to claim 77:

25 wherein the printed circuit board is a light transmitting substrate; and

the first surface of the functional device is a CCD.

91. The electronic device as set forth in from claim 57 to claim 77:

wherein the printed circuit board is a light transmitting substrate; and

the functional device is a semiconductor laser which first surface is a light emitting surface.

5 92. The electronic device as set forth in from claim 57 to
claim 77:

wherein the printed circuit board is a light transmitting substrate; and

the functional device is a light emitting diode which first surface is a light emitting surface.

10 93. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

15 forming a conductive film on a second surface of the functional device;

electrically connecting the conductive film and a wiring pattern on the first surface of the printed circuit board with a conductive material; and

20 sealing a space portion formed between the printed circuit board and the functional device with a sealing member while preventing at least the sealing member from spreading into the space portion.

25 94. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

disposing a metallic foil on a second surface of the functional

device;

connecting the metallic foil and wiring pattern of the first surface of the printed circuit board with electrically connecting means; and

5 sealing at least a space portion between the printed circuit board and the functional device with a sealing member while preventing the sealing member from spreading into the space portion.

95. A fabricating method for fabricating an electronic device, comprising the steps of:

10 disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

forming a conductive film on a second surface of the functional device;

15 electrically connecting between the conductive film and a wiring pattern on the first surface of the printed circuit board with a magnetic material dispersed resin; and

sealing a space portion between the printed circuit board and the functional device with a sealing member while preventing at least the sealing member from spreading into the space portion.

20 96. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

25 and, sealing a space portion formed between the printed circuit board and the functional device with a sealing member composed of a metal powder dispersed resin while preventing at least the sealing member from spreading into the space portion.

97. A fabricating method for fabricating an electronic

device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

and, sealing a space portion formed between the printed circuit board and the functional device with a sealing member composed of a magnetic powder dispersed resin while preventing at least the sealing member from spreading into the space portion.

98. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

and, sealing a space portion formed between the printed circuit board and the functional device with a sealing member composed of an electromagnetic wave absorbing material dispersed resin while preventing at least the sealing member from spreading into the space portion.

99. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

and, sealing a space portion formed between the printed circuit board and the functional device with a sealing member composed of a resin containing conductive filler while preventing at least the sealing member from spreading into the space portion.

100. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

sealing a space portion formed between the printed circuit board and the functional device with a sealing member while preventing at least the sealing member from spreading into the space portion; and,

5 covering the first surface of the printed circuit board and the functional device with a metal plate by engaging a pair of convex portions disposed so as to oppose on two leg portions of the metal plate and respective concave portions disposed on two edge surfaces of the printed circuit board.

101. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

15 sealing a space portion formed between the printed circuit board and the functional device with a sealing member while preventing at least the sealing member from spreading into the space portion; and,

covering the first surface of the printed circuit board and the functional device with a metal plate by engaging a pair of convex portions disposed so as to oppose each other on two leg portions of the metal plate and two concave parts disposed on the two edge surfaces of the printed circuit board, and by electrically connecting the wiring pattern disposed inside the concave portion and the wiring pattern disposed at the tip end of the convex part.

25 102. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

sealing a space portion formed between the printed circuit board and the functional device with a sealing member while preventing at least the sealing member from spreading into the space portion; and

5 covering the first surface of the printed circuit board and the functional device with a metal plate by engaging a pair of protruded portions disposed so as to mutually oppose on two leg portions of the metal plate and respective stepped portions disposed on two side surfaces of the printed circuit board so as to form an upper step on the first surface side.

103. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

15 sealing a space portion formed between the printed circuit board and the functional device with a sealing member while preventing at least the sealing member from spreading into the space portion; and

20 covering the first surface of the printed circuit board and the functional device with a metal plate by engaging a pair of protruded portions disposed so as to mutually oppose on two leg portions of the metal plate and respective stepped portions disposed on two side surfaces of the printed circuit board so as to form upper steps on the first surface side, and by electrically connecting wiring patterns disposed on lower step surfaces of the side surfaces and wiring patterns at tip ends of the protruded portions.

25 104. A fabricating method for fabricating an electronic device,

comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

disposing a buffering member on a second surface of the

5 functional device; and

sealing a space portion formed between the printed circuit board and the functional device with a sealing member while preventing at least the sealing member from spreading into the space portion.

10 105. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

and, sealing a space portion formed between the printed circuit board and the functional device with a sealing member composed of a resin containing glass filler while preventing at least the sealing member from spreading into the space portion.

15 106. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device while disposing a connecting member, which connect electrically a wiring pattern of the printed circuit board and a wiring pattern of the functional device, around a central part of the functional device;

20 25 and

sealing a space portion formed between the printed circuit board and the functional device with a sealing member while preventing at least the sealing member from spreading into the space

portion.

107. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device while disposing a first connecting member, which electrically connect a wiring pattern of the printed circuit board and a wiring pattern of the functional device, intensively around a central part of the functional device and, further, disposing a second connecting member, which do not participate in electrical connection between the wiring pattern of the printed circuit board and the wiring pattern of the functional device, around a peripheral region of the functional device; and

sealing a space portion formed between the printed circuit board and the functional device with a sealing member while preventing at least the sealing member from spreading into the space portion.

108. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device while laying a conductive connecting member between a second wiring pattern of the printed circuit board and a wiring pattern of the functional device, wherein the first wiring pattern composed of conductive material of a first thickness and a second wiring pattern composed of the conductive material of a second thickness thicker than that of the first one are formed on the first surface of the printed circuit board; and

sealing a space portion between the printed circuit board and the functional device a with sealing member while preventing at least the sealing member from spreading into the space portion.

109. A fabricating method for fabricating an electronic
5 device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device while laying a conductive connecting member between a wiring pattern on a second region of the printed circuit board and a wiring pattern of the functional device, wherein the printed circuit board has, on the first surface, a first region of a substrate material of a first thickness and a second region of the substrate material of a second thickness thicker than the first thickness, and wiring patterns are formed on the first and second regions of the first surface of the printed circuit board; and

10 15 sealing a space portion formed between the printed circuit board and the functional device with a sealing member while preventing at least the sealing member from spreading into the space portion.

20 110. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device while laying conductive connecting members consisting of bumps piled up corresponding to a spacing between a wiring pattern on the first 25 surface of the printed circuit board and a wiring pattern on the first surface of the functional device; and

sealing a space portion formed between the printed circuit

board and the functional device with a sealing member while preventing at least the sealing member from intruding the space portion.

111. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device, which is a surface acoustic wave device, provided with a sound absorption material on the first surface, while laying between them a conductive connecting member of a height higher than the thickness of the sound absorption material; and

sealing a space portion formed between the printed circuit board and the functional device with a sealing member while preventing the sealing member from spreading into at least the space portion.

112. A fabricating method for fabricating an electronic device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device, which is a surface acoustic wave device, while laying between them a conductive connecting member;

forming a sound absorption material on a second surface of the functional device; and

25 sealing a space portion formed between the printed circuit board and the functional device with a sealing member while preventing the sealing member from spreading into at least the space portion.

113. A fabricating method for fabricating an electronic

device, comprising the steps of:

disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device, an acoustic surface wave device, while laying between them a conductive connecting member;

forming a sound absorption material on a second surface of the functional device;

disposing a metallic foil on the second surface of the functional device; and

sealing a space portion formed between the printed circuit board and the functional device with a sealing member while preventing at least the sealing member from spreading into the space portion.

114. The fabricating method for fabricating the electronic device as set forth in from claim 93 to claim 113:

wherein the sealing member is a hot-melt type member; and the sealing step comprises the steps of;

disposing the hot-melt type member above a first surface of the printed circuit board and/or a second surface of the functional device; and

by heating/melting the hot-melt type member, sealing a space portion formed between the printed circuit board and the functional device device while preventing the sealing member from spreading into the space portion.

25 115. The fabricating method for fabricating the electronic device as set forth in from claim 93 to claim 113:

wherein the sealing member is a thermo-setting member; and the sealing step comprises the steps of;

pouring a liquid hot-melt type member on a predetermined position from above the first surface of the printed circuit board and/or the second surface of the functional device; and,

- 5 by heating/hardening the poured thermo-setting member, sealing a space portion formed between the printed circuit board and the functional device while preventing the sealing member from spreading into the space portion.

116. The fabricating method for fabricating the electronic device as set forth in from claim 93 to claim 113:

10 wherein the sealing member is a thermo-setting member; and
the sealing step comprises a step for sealing;
15 by heating/hardening the poured thermo-setting member while dripping the liquid thermo-setting member on a predetermined position from above the first surface of the printed circuit board and/or the second surface of the functional device, sealing a space portion formed between the printed circuit board and the functional device preventing the sealing member from spreading into the space portion.

- 20 117. The fabricating method for fabricating the electronic device as set forth in from claim 93 to claim 113, further comprising
the step of;

25 prior to the step for disposing in an opposite relation, on the first surface of the printed circuit board, disposing a frame-shaped member in such a manner that surrounds the space portion.

118. The fabricating method for fabricating the electronic device as set forth in from claim 93 to claim 113:

wherein, in the step for sealing, the sealing member is formed

in such a manner that covers all the second surface of the functional device.

119. The fabricating method for fabricating the electronic device as set forth in from claim 93 to claim 113:

5 wherein, in the step for sealing, the sealing member is formed in such a manner that exposes all of the second surface of the functional device.

120. The fabricating method for fabricating the electronic device as set forth in from claim 93 to claim 113:

10 wherein, in the step for sealing, the sealing member is formed in such a manner that partially exposes the second surface of the functional device.

121. The fabricating method for fabricating the electronic device as set forth in from claim 93 to claim 113:

15 wherein, in the step for disposing oppositely, the first surface of the printed circuit board is disposed in an opposite relation with the first surface of the functional device through a conductive connecting member.

122. The fabricating method for fabricating the electronic device as set forth in from claim 93 to claim 113:

20 wherein, the functional device is a surface acoustic wave device; and

25 in the step for disposing oppositely, the wiring pattern of the first surface of the printed circuit board is disposed in an opposite relation with the wiring pattern of the first surface of the surface acoustic wave device through a conductive connecting member based on the face-down bonding method.

123. The fabricating method of the electronic device as set

forth in from claim 93 to claim 113:

wherein the functional device is a quartz oscillator or resonator;

and, further comprising the steps of;

5 disposing, in the opposite manner disposing step, the connecting pattern of the first surface of the printed circuit board and the electrodes of the first surface of the quartz oscillator or resonator in an opposite relation through the conductive connecting member based on the face-down bonding method, and connecting electrically the wiring pattern on the first surface of the printed circuit board and the electrodes on the second surface of the quartz oscillator or resonator through an electrically connecting means; and

thereafter, disposing the surrounding member on the printed circuit board so as to surround the quartz oscillator or resonator.

124. The fabricating method of the electronic device as set forth in from claim 93 to claim 113:

wherein the functional device is a piezoelectric oscillator or resonator;

20 and, further comprising the steps of;

disposing, in the oppositely disposing step, the connecting pattern of the first surface of the printed circuit board and the electrodes of the first surface of the piezoelectric oscillator or resonator in an opposite relation through the conductive connecting member based on the face-down bonding method; and

connecting electrically the wiring pattern on the first surface of the printed circuit board and the electrodes on the second surface of the piezoelectric oscillator or resonator through an

electrical connecting means.

125. The fabricating method of the electronic device as set forth in from claim 93 to claim 113:

wherein the functional device is a photocoupler possessing
5 a pair of a light sending portion and a light receiving portion;
and, further comprising the steps of;

in the oppositely disposing step, the connecting pattern of
the first surface of the printed circuit board and the wiring pattern
of each first surface of the photocoupler in an opposite relation
through the conductive connecting member based on the face-down
bonding method; and

thereafter, disposing the surrounding member on the printed
circuit board so as to surround the photocoupler.

126. The fabricating method of the electronic device as set
forth in from claim 93 to claim 113:

wherein the printed circuit board is a light transmitting
substrate and the functional device is an EPROM; and

in an opposedly disposing step, the first surface of the
printed circuit board and a light receiving surface of the EPROM
20 are disposed in an opposite relation.

127. The fabricating method of the electronic device as set
forth in from claim 93 to claim 113:

wherein the printed circuit board is a light transmitting
substrate and the functional device is a CCD; and

25 in an opposedly disposing step, the first surface of the
printed circuit board and a light receiving surface of the CCD are
disposed in an opposite relation.

128. The fabricating method of the electronic device as set

forth in from claim 93 to claim 113:

wherein the printed circuit board is a light transmitting substrate and the functional device is a semiconductor laser; and

in an opposedly disposing step, the first surface of the printed circuit board and a light emitting surface of the semiconductor laser are disposed in an opposite relation.

129. The fabricating method of the electronic device as set forth in from claim 93 to claim 113:

wherein the printed circuit board is a light transmitting substrate and the functional device is a light emitting diode; and

in an opposedly disposing step, the first surface of the printed circuit board and a light emitting surface of the light emitting diode are disposed in an opposite relation.

130. The fabricating method for fabricating the electronic device as set forth in from claim 93 to claim 113:

wherein, the functional device possesses bumps;
in the step for oppositely disposing, the bumps on the functional device is disposed in an opposite relation with the printed circuit board; and

thereafter, further, the printed circuit board is connected to the functional device while irradiating an infra-red light on the printed circuit board and/or the bumps.

131. A fabricating method for fabricating an electronic device, comprising the steps of:

25 aligning a plurality of functional devices to an aggregate consisting of a plurality of printed circuit boards at a predetermined position;

assembling the functional devices and the aggregate of the

printed circuit boards through conductive connecting members with a predetermined spacing;

disposing a hot-melt type member on the aggregate consisting of the functional devices and the printed circuit boards;

5 heating and melting the hot-melt type member while preventing the hot-melt type member from spreading into a space portion between the printed circuit boards and the functional devices;

and, separating the aggregate of a plurality of the printed circuit boards together with the hot-melt type member into individual electronic devices.

132. A fabricating method for fabricating an electronic device, comprising the steps of:

aligning a functional device to a printed circuit board at a predetermined position;

15 assembling the functional device and the printed circuit board through a conductive connecting member with a predetermined spacing;

disposing a hot-melt type member on the printed circuit board; and

20 heating and melting the hot-melt type member while preventing the hot-melt type member from spreading into a space portion formed between the printed circuit board and the functional device,

wherein, the hot-melt type member is a sheet of a hot-melt type resin; and

25 a step for heating, melting and hardening the hot-melt type member comprises at least the steps of;

(1) by heating/melting, determining the shape of the sheet of the hot-melt type resin;

(2) transferring to a gel state maintaining the shape of the resin;

(3) hardening the resin;

and process temperature of the step (2) is lower than that
5 of (1) or (3).

133. A fabricating method for fabricating an electronic device comprises the steps of:

110 assembling the surface acoustic wave device and the printed circuit board through a conductive connecting member with a predetermined spacing;

disposing a hot-melt type member on the printed circuit board;
and

15 heating and melting the hot-melt type member while preventing the hot-melt type member from spreading into a space portion formed between the printed circuit board and the surface acoustic wave device,

wherein, a transducer portion and a plurality of wiring patterns, which electrically connect to the transducer portion, are formed on one main surface of a wafer, which is composed of a piezoelectric material and serves as the surface acoustic wave device, and a plurality of the connecting members is formed on a part of the wiring patterns, thereafter, when forming individual surface acoustic wave devices by cutting, blade speed of from not less than 10 mm/sec to not more than 50 mm/sec is employed.

20 25 134. A fabricating method for fabricating an electronic device, comprising the steps of:

10

aligning a surface acoustic wave device against a printed circuit board at a predetermined position;

assembling the surface acoustic wave device and the printed circuit board through a conductive connecting member with a
5 predetermined spacing;

disposing a hot-melt type member on the printed circuit board;
and

heating/melting the hot-melt type member while preventing the hot-melt type member from spreading into a space portion between the printed circuit board and the surface acoustic wave device,

wherein, on one main surface of a wafer of a piezoelectric material constituting the surface acoustic wave device, a transducer portion and a plurality of wiring patterns connecting electrically to the transducer portions is formed and, a plurality of the connecting members is formed on a part of the wiring patterns, thereafter, when individual surface acoustic wave devices are formed by cutting, cutting operation is executed with water of an electrical resistivity of from not less than 0.01 M cm to not more than 100 M cm.

20 135. A fabricating method for fabricating an electronic device, comprising the steps of:

aligning a functional device at a predetermined position relative to a printed circuit board;

assembling the functional device and the printed circuit board
25 through conductive connecting members while maintaining a predetermined spacing therebetween;

disposing a hot-melt type member against the printed circuit board;

heating/melting the hot-melt type member while leaving a space portion between the printed circuit board and the functional device; and,

5 after forming the conductive connecting member on a wiring pattern formed at least on one main surface of the printed circuit board, assembling the functional device and the printed circuit board through the conductive connective members while maintaining a predetermined spacing therebetween.

10 136. A functional device disposed on a substrate based on a face-down bonding method, comprising:

a plurality of connecting terminals electrically connected with the substrate and intensively disposed around a central portion of one main surface of the functional device.

15 137. The functional device as set forth in claim 136; wherein, the functional device possesses a relatively long and narrow shape.

138. The functional device as set forth in claim 136 or claim 137:

20 wherein the functional device is a surface acoustic wave device.

139. A surface acoustic wave device, comprising:
a piezoelectric substrate;
a plurality of pairs of comb-shaped electrodes formed on the piezoelectric substrate; and
25 a group of external connecting terminals disposed intensively around a central part of the piezoelectric substrate.

140. The surface acoustic wave device as set forth in claim 139, further comprising;

a sound absorbing member formed on the piezoelectric substrate in such a manner that hold therebetween the comb-shaped electrodes.

141. The surface acoustic wave device as set forth in claim 139 or claim 140;

5 wherein, on both peripheries of the piezoelectric substrate, electrode pads not participating in external connection are disposed.

142. The surface acoustic wave device as set forth in claim 139 to claim 141;

10 wherein the group of external connecting terminals extend to the comb-shaped electrode to connect them electrically.

143. An image pick up apparatus, comprising:
an optical system receiving an imaging light;
a printed circuit board having a first surface and a second surface; a CCD device having a first surface and a second surface, the first surface thereof being disposed opposedly to the first surface of the printed circuit board; and a hot-melt type member sealing a space portion formed between the first surface of the printed circuit board and the first surface of the CCD device while preventing the hot-melt type member from spreading into the space portion; wherein the CCD device executes photo-electric conversion of the light image entering the CCD from the optical system.

144. A mobile communication apparatus comprising a surface acoustic wave filter as a band-pass filter in radio-frequency region, 25 the surface acoustic wave filter comprising;

a printed circuit board possessing a first surface and a second surface;

a surface acoustic wave device possessing a first surface and

a second surface, the first surface being disposed in an opposite relation with the first surface of the printed circuit board; and,

5 a hot-melt type member sealing a space portion formed between the first surface of the printed circuit board and the first surface of the surface acoustic wave device while preventing the sealing member from spreading into the space portion.

145. A mobile communication apparatus comprising a surface acoustic wave filter as a band-pass filter in intermediate-frequency region, the surface acoustic wave filter comprising;

10 a printed circuit board possessing a first surface and a second surface;

a surface acoustic wave device possessing a first surface and a second surface, the first surface being disposed in an opposite relation with the first surface of the printed circuit board;

15 and a hot-melt type member sealing a space portion formed between the first surface of the printed circuit board and the first surface of the surface acoustic wave device while preventing the sealing member from spreading into the space portion.

146. A mobile communication apparatus comprising a surface acoustic wave resonator as an oscillator of a frequency modulator, the surface acoustic wave resonator comprising;

20 a printed circuit board possessing a first surface and a second surface;

25 a surface acoustic wave device possessing a first surface and a second surface, the first surface being disposed in an opposite relation with the first surface of the printed circuit board;

and, a hot-melt type member sealing a space portion between the first surface of the printed circuit board and the first surface

of the surface acoustic wave device while preventing the sealing member from spreading into the space portion.

147. An oscillator or resonator circuit comprising a surface acoustic wave resonator or resonator for an oscillator or resonator circuit in a radio-frequency modulator, the surface acoustic wave resonator comprising;

5 a printed circuit board possessing a first surface and a second surface;

10 a surface acoustic wave device possessing a first surface and second surface, the first surface being disposed in an opposite relation with the first surface of the printed circuit board; and

15 a hot-melt type member sealing a space portion between the first surface of the printed circuit board and the first surface of the surface acoustic wave device while preventing the sealing member from spreading into the space portion.

148. An oscillator or resonator circuit comprising a quartz oscillator or resonator as an oscillator or resonator of a radio-frequency modulator, the quartz oscillator or resonator comprising;

20 a printed circuit board having a first surface and a second surface;

25 a quartz oscillator or resonator possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with the first surface of the printed circuit board;

conductive connecting members connecting the connecting pattern of the first surface of the printed circuit board and the electrodes of the first surface of the quartz oscillator or

resonator based on the face-down bonding method;

an electrically connecting means for electrically connecting the wiring pattern of the first surface of the printed circuit board and the electrodes of the second surface of the quartz oscillator or resonator; and

5

a hot-melt type member sealing a space portion between the first surface of the printed circuit board and the first surface of the quartz oscillator or resonator while preventing the sealing member from spreading into the space portion.

10 149. A fabricating method for fabricating an electronic device, comprising the steps of:

(a) disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

15 (b) pouring a liquid thermo-setting member at a predetermined position from above the first surface of the printed circuit board and/or the second surface of the functional device; and

(c) by hardening the poured thermo-setting member by heating, sealing a space portion formed between the printed circuit board and the functional device while preventing the sealing member from 20 spreading into the space portion.

25 150. A fabricating method for fabricating an electronic device, comprising the steps of:

(a) disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

and

(b) heating and hardening a thermo-setting member while dripping a liquid thermo-setting member to a predetermined position from above the first surface of the printed circuit board and/or

a second surface of the functional device, and sealing a space portion between the printed circuit board and the functional device while preventing the sealing member from spreading into at least the space portion.

5 151. A fabricating method for fabricating an electronic device, comprising the steps of:

aligning a functional device against a printed circuit board at a predetermined position;

10 assembling the functional device and the printed circuit board through a conductive connecting member with a predetermined spacing;

disposing a hot-melt type member on the printed circuit board;

heating and melting the hot-melt type member while preventing the hot-melt type member from spreading into the space portion between the printed circuit board and the functional device; and

15 hardening the heated/melted hot-melt type member,

wherein, after the conductive connecting member is formed at least on a wiring pattern formed on one main surface of the printed circuit board, the functional device and the printed circuit board 20 are assembled through the conductive connecting member with a predetermined spacing.

152. A fabricating method for fabricating an electronic device, comprising the steps of:

(a) disposing a first surface of a printed circuit board in 25 an opposite relation with a first surface of a functional device;

(b) disposing a hot-melt type member above the first surface of the printed circuit board and/or a second surface of the functional device; and

(c) by heating/melting the hot-melt type member, sealing a first space portion formed between the printed circuit board and the functional device while preventing the sealing member from spreading into at least the first space portion, and further 5 preventing the sealing member from spreading into a second space portion formed between the second surface of the functional device and the hot-melt type member.

110 153. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface;

a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with the first surface of the printed circuit board; and

15 15 a hot-melt type member for sealing a first space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the hot-melt type member from spreading into the first space portion and a second space portion formed between the second surface of the functional device and the hot-melt type member.

20 154. A fabricating method for fabricating an electronic device, comprising steps of:

(a) disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

25 (b) coating a thermo-setting type buffering member on a bottom surface of a concave-shaped hot-melt type member;

(c) disposing the hot-melt type member above the first surface of the printed circuit board and/or a second surface of the functional device while interposing the thermo-setting type

buffering member therebetween; and

(d) by heating/melting the hot-melt type member, sealing a space portion formed between the printed circuit board and the functional device while preventing the sealing member from spreading into at least the space portion.

155. The fabricating method for fabricating an electronic device as set forth in claim 154;

wherein the thermo-setting type buffering member is a liquid silicone.

156. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface;

a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with the first surface of the printed circuit board;

20 a hot-melt type member for sealing a first space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the hot-melt type member from spreading into the first space portion and a second space portion formed between a second surface of the functional device and the hot-melt type member; and

25 a thermo-setting type buffering member interposed between the second surface of the functional device and the hot-melt type member.

157. The electronic device as set forth in claim 156:

wherein the thermo-setting type buffering member is a liquid silicone.

158. The fabricating method for fabricating the electronic

device as set forth in claim 1:

wherein an aligning means for aligning the hot-melt type member to the functional device is provided.

159. The fabricating method for fabricating the electronic
5 device as set forth in claim 158:

wherein the hot-melt type member possesses a flap shape along a peripheral portion thereof relative to the functional device.

160. A fabricating method for fabricating an electronic device, comprising steps of:

(a) disposing a first surface of a printed circuit board in an opposite relation to a first surface of a functional device;

(b) disposing a buffering member of a first packing density on a second surface of the functional device;

(c) disposing a sealing member of a second packing density larger than the first packing density above the first surface of the printed circuit board and/or the second surface of the functional device; and

(d) sealing a space portion between the printed circuit board and the functional device with a sealing member while preventing the sealing member from spreading into at least the space portion.

20 161. A fabricating method for fabricating an electronic device, comprising steps of:

(a) disposing a first surface of a printed circuit board in an opposite relation with a first surface of a functional device;

25 (b) disposing buffering members of a first and a second packing density in layers on the second surface of the functional device;

(c) disposing a sealing member of a third packing density larger than both of the first and the second packing density above

the first surface of the printed circuit board and/or a second surface of the functional device; and

5 (d) sealing a space portion formed between the printed circuit board and the functional device with the sealing member while preventing the sealing member from spreading into at least the space portion.

162. An electronic device, comprising:

a printed circuit board possessing a first surface and a second surface;

10 a functional device possessing a first surface and a second surface, the first surface thereof being disposed in an opposite relation with the second surface of the printed circuit board;

15 a hot-melt type member for sealing a space portion formed between the first surface of the printed circuit board and the first surface of the functional device while preventing the hot-melt type member from spreading into the space portion; and

20 a means for preventing deformation of the functional device with respect to a relation between the functional device and the hot-melt type member.

163. The electronic device as set forth in claim 162:

wherein the means for preventing the deformation is a buffering member disposed between the functional device and the hot-melt type member.

164. The electronic device as set forth in claim 162:

25 wherein the means for preventing the deformation is a space formed between the functional device and the hot-melt type member.

165. The electronic device as set forth in claim 162:

wherein the means for preventing the deformation is a lot of

bubbles included in the hot-melt type member.

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